

Low Cost, Cosmic Microwave Background Telescopes (P-NASA12-003), Phase I

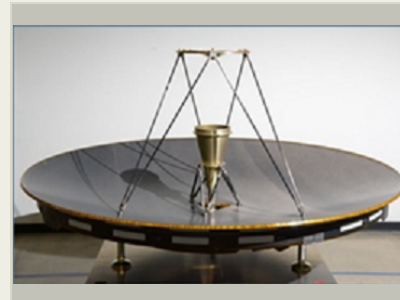
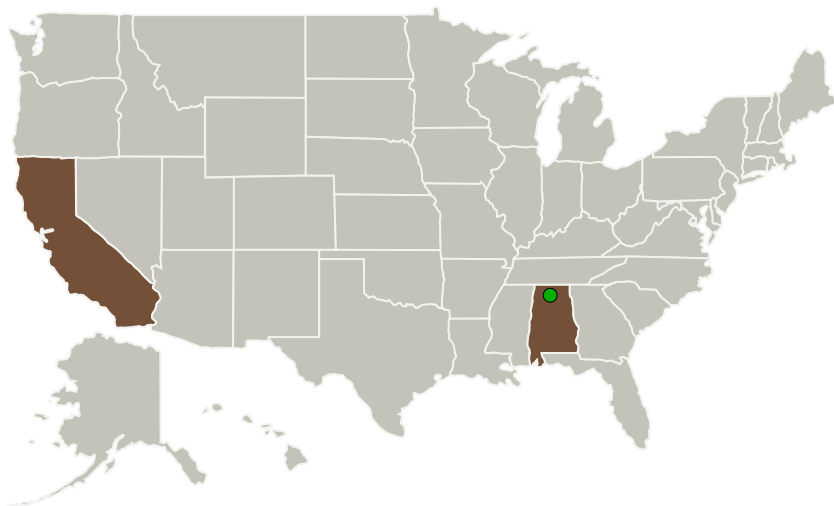
Completed Technology Project (2013 - 2013)



Project Introduction

The Phase I objective is to develop a preliminary design and manufacturing plan for carbon fiber composite reflectors and/or a carbon fiber telescope that are traceable to the requirements of current and future CMB missions. The Phase II objectives are to complete the design and manufacturing planning, fabricate necessary tooling, manufacture hardware components that include two reflector support structures, integrate and align the reflectors and confirm telescope optical performance via analysis of as-built mechanical alignment and surface accuracy data. To prepare for and conduct the PDR within six months, the proposed Phase I tasks will include: 1) Develop telescope requirements in conjunction with CMB researchers and/or NASA with the goal of resolving sufficient detail to evaluate CFRP technology for CMB missions, 2) Compare the requirements to CFRP heritage, as-built results, and experience, 3) Develop a concept based upon high (currently 4-9) TRL CFRP component technologies, 4) Predict the performance of the concept, 5) Develop a pricing model to predict recurring cost, 6) Define a preliminary manufacturing plan that includes predicted versus budgeted errors, 7) Develop a summary technical/cost compliance matrix that summarizes all technical and cost predictions versus requirements, 8) Summarize all engineering, manufacturing, and cost information in preparation for PDR including the envisioned path to telescope TRL6 during Phase II, and 9) Conduct a PDR with support from mechanical, optical, structural, thermal, materials, and manufacturing engineers.

Primary U.S. Work Locations and Key Partners



Low Cost, Cosmic Microwave Background Telescopes (P-NASA12-003)

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

Low Cost, Cosmic Microwave Background Telescopes (P-NASA12-003), Phase I

Completed Technology Project (2013 - 2013)



Organizations Performing Work	Role	Type	Location
Vanguard Space Technologies, Inc	Lead Organization	Industry	San Diego, California
● Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

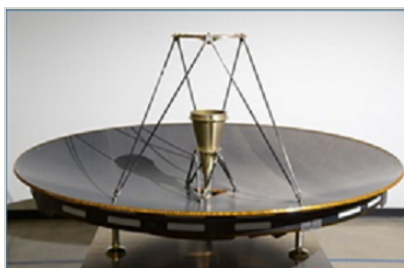
Primary U.S. Work Locations	
Alabama	California

Project Transitions

**May 2013:** Project Start**November 2013:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/140700>)

Images

**Project Image**

Low Cost, Cosmic Microwave Background Telescopes (P-NASA12-003)

(<https://techport.nasa.gov/image/134362>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Vanguard Space Technologies, Inc

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

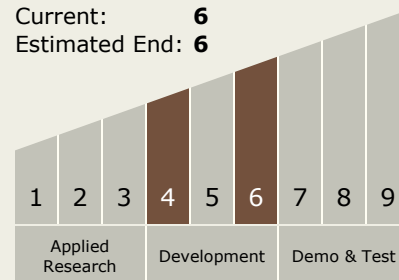
Jeffrey Loomis

Technology Maturity (TRL)

Start: **4**

Current: **6**

Estimated End: **6**



Low Cost, Cosmic Microwave Background Telescopes (P-NASA12-003), Phase I

Completed Technology Project (2013 - 2013)



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.1 Detectors and Focal Planes

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System